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<p><b>(21) International Application Number:</b> PCT/FI93/00405</p> <p><b>(22) International Filing Date:</b> 7 October 1993 (07.10.93)</p> <p><b>(71) Applicant (for all designated States except US):</b> MUODON-MUUTOS OY [FI/FI]; Hatanpääntäti 1 B, FIN-33100 Tampere (FI).</p> <p><b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> KAHILAINEN, Hannu [FI/FI]; Ritakuja 6, FIN-36200 Kangasala (FI).</p>	<p><b>(81) Designated States:</b> CA, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p><b>Published</b> With international search report. In English translation (filed in Finnish).</p>	
<p><b>(54) Title:</b> PATIENT'S CONTAINER OF MEDICAL EQUIPMENT FOR USE AT HOME</p>		
<p><b>(57) Abstract</b></p> <p>A container of medical equipment is intended for use by a diabetic patient at home. The container comprises a container frame (1), closing means (2) for sealing the container frame (1) for transport, as well as an inside part with fixing and storage means for the medical equipment used at home. By opening the closing means (2), it is possible to take out the inside part from the container frame (1) particularly for the needs of self-care at home. The inside part is provided with means (10), particularly with a filling part (10) made of an elastic material, which is intended for receiving at least part of the individual equipment (17-20) for self-care by the diabetic patient, at receiving locations to be formed particularly when the container and/or new equipment is taken into use.</p>		

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Patient's container of medical equipment for use at home

5       The invention relates to a container of medical  
equipment for use by a diabetic or corresponding  
patient at home. The container comprises a container  
frame, closing means for locking the container frame  
10       for transport, as well as an inside part with fixing  
and storage means for the medical equipment used at  
home. By opening the closing means, it is possible to  
expose the inside part from the frame particularly  
for the needs of self-care at home.

15       Containers of similar type are previously known e.g.  
from DE-3400210, US-4,429,793 and US-4,848,587. How-  
ever, the containers disclosed in these publications  
are intended for use in only part of the operations  
that must be carried out in the care of a diabetic  
20       patient at home. In other words, the containers of  
prior art are insufficient particularly in respect of  
the care of the diabetic patient as a whole.

For society, self-care by diabetic patients at home  
25       is very advantageous, because the number of personnel  
needed in diabetic care can be maintained at a reason-  
able level, the diabetic patients being substantially  
independently responsible for the measures needed in  
the treatment of the disease. It is also obvious that  
30       successful care at home improves the patient's quality  
of life and thus makes it possible for the patient e.g.  
to have an interesting professional career. Successful  
care at home, with the purpose of achieving reasonable  
blood sugar levels, reduces the risk in long-term  
35       diabetes of contracting other diseases related to  
diabetes, such as nervous, opthalmic and renal diseases  
as well as diseases of the circulatory system.

It must be noted that a majority of the total of about 30'000 diabetic patients treated with insulin in Finland are active people who spend a substantial part of their time at schools, colleges, at work as well as at recreational facilities and travelling. Consequently the diabetic patients must also take care of their diabetes by themselves.

One problem that has lead to the present invention is the impossibility, when using containers of prior art, to carry the medical equipment needed in self-care, with particular respect to the self-care as a whole. As an example, for insulin pens and blood sugar meters separate containers are available which are difficult to carry along, particularly in view of the fact that also other equipment are needed in the self-care as a whole, including parts and accessories such as needles, towelettes, sticks for the blood sugar meter, lancets, etc. Consequently, the self-care by the patient is an extensive whole, and for ensuring its continuous maintenance, it is very important that all the medical equipment for use by the diabetic patient can be easily assembled in one container and that the container is so designed that the equipment are easily accessible for the patient to use. The container should naturally be small in size as well as inconspicuous in appearance, light in weight and strong in quality; further, it should be resistant against impacts and temperature changes, if necessary, so that particularly changes in insulin temperature would not be extensive enough to damage or decompose the insulin.

Another very serious problem in the treatment of diabetes by the patient at home is caused by the variety of medical equipment used. There are e.g. several models of blood sugar meters, lancet tripping devices and insulin pens, and the diabetic patient

may well have medical equipment consisting of a large variety of components at his or her disposal.

5 It is an aim of this invention to present a patient's container of medical equipment, whereby the problems relating to the care of the diabetic patient at home as presented above can be eliminated to a large extent and the state of art can thus be improved. For achieving this aim, the container of medical equipment is  
10 primarily characterized in that at least part of the inside part of the container is provided with means that are adjustable according to the dimensions of the medical equipment, particularly with a filling part made of a deformable material and/or with an adhesive  
15 arrangement or the like, whereby the part equipped with said means is intended for receiving at least part of the individual equipment for use by the diabetic patient at receiving locations which are formed particularly when the container and/or new  
20 medical equipment are taken into use. A container of the type described above can naturally be designed in a variety of ways with respect to its appearance and also its function, but the deformable means always enable the patient to shape the filling part to receive  
25 his or her individual equipment for self-care.

According to a particularly advantageous embodiment, the container, comprising two frame parts of substantially equal size, a first and a second frame part  
30 which are joined together to a combination that can be opened and closed at the edge between the frame parts so that the inside part is also divided into a first and a second section of the inside part, is characterized in that said means are placed in connection with the first inside section and that the second  
35 inside section is formed of a series of storage locations, whereby the means are intended particularly for receiving treatment devices, such as the blood sugar

meter, insulin syringes, etc., and the storage locations are intended particularly for receiving parts and accessories needed in the use of the devices, such as sticks, needles, etc. This solution provides  
5 a compact container for medical equipment with a clear division into medical devices on one hand and parts and accessories on the other hand.

One advantageous embodiment of the container for  
10 medical equipment according to the invention is characterized in that the inside part comprises a support, preferably fixed to the container frame, which is placed at least against the inside part in the closed transport position of the container and which  
15 is intended substantially for exposing the medical equipment, to be placed outside the container frame during the use of the contents, thus preferably to be used as an operational support. Thus the support, arranged in the above-described manner and placed in  
20 the container, operates in the closed position of the container as an arresting means which prevents unnecessary movements of the medical devices and possibly also of accessories in the inside part during transportation of the container. For the time of the actual  
25 self-care operations, it can be placed as an operational support, thus providing a sufficiently hygienic environment e.g. for measuring the blood sugar level en route.

30 Further, some advantageous embodiments of the container for medical equipment of the invention are presented in the appended dependent claims.

The invention will be more closely illustrated in the  
35 following description with reference to an embodiment shown in the appended drawings. In the drawings,

- Fig. 1 shows a perspective view of a closed container for medical equipment ready for transportation,
- 5 Fig. 2 shows the container of Fig. 1 at the first stage of its use, whereby the container is partly opened by bringing the container frame parts apart, also in perspective view,
- 10 Fig. 3 shows the container opened before its actual use in self-care, for illustrating details of the structure, also in perspective view,
- 15 Fig. 4 shows a perspective view of the container during self-care operations,
- Fig. 5 shows a cross-sectional view from the direction V-V in Fig. 3,
- 20 Figs. 6-8 show different recess designs of the inside part,
- 25 Fig. 9 shows an embodiment particularly with an alternative support seen in the direction of Fig. 2, and
- Fig. 10 shows another embodiment of the container in the situation of Fig. 3.
- 30

With particular reference to Fig. 1, the container for medical equipment according to the invention comprises a container frame 1 consisting of two container frame parts 1a, 1b. In the closed position of the container, the frame parts are joined together at three edges, and the fourth edge forms a pivoted or folded edge 1c whereby the frame parts are connected

35

for opening the container for use. In the present embodiment, the container has a substantially rectangular shape with rounded corners when seen from above. The thickness of the container is substantially  
5 twice the height of the frame part edges 1d. The edges 1d are substantially transverse to the bottom surfaces 1e of the frame parts. The joint section 1f of the outer surfaces of the edges (Fig. 5) can be suitably provided with compatible sealing means. On  
10 the opposite side of the pivoted edge 1c, the frame parts 1a, 1b have closing means 2 whereby the frame parts are connected to each other in the closed transport position of the container. Further, the outer surfaces of the frame parts may comprise text  
15 and/of figures informing of the use of the container, as shown by the reference numeral 3 in Fig. 1. Moreover, the container for medical equipment may be equipped with a wrist hanger 4 or a similar carrying device.

20  
With particular reference to Fig. 2 showing the container at the first stage of its use, whereby the container frame parts 1a, 1b are pulled apart by releasing the locking of the closing means 2, and the  
25 frame parts 1a, 1b are turned around the pivoted edge 1c with respect to each other so that the support 5 is unveiled from the inside of the container. The support 5 is preferably plate-like, and its surface area corresponds to the common area of the frame  
30 parts 1a, 1b of the container frame 1, limited by the inner surfaces of the edges 1d of the frame parts. The support 5 is in a similar manner provided with text and possibly figures informing of the use of the container, as shown by the reference numeral 6 in  
35 Fig. 2. The support 5 is fixed to the edges of the frame parts 1 by a bending piece 7. The bending piece 7 is advantageously placed against the shorter edges of the frame parts 1a, 1b, whereby the other shorter



edges, opposite to the bending piece 7, of the frame parts 1a, 1b are provided with locking means 8 for locking the position of the support 5 for transportation in the closed position of the container. Further, the support 5 is provided with a lifting loop 9 or corresponding means for detaching the support from the locking means 8 and for turning it around the bending piece 7 upwards to a position shown in Figs. 3 and 4, where the support 5 is used as an operational support outside the container frame 1 and is connected by the bending piece 7 to the container frame. The bending piece 7 can be so designed that the support 5 is positioned substantially in the same plane as the bottoms of the frame parts, i.e. the bending piece 7 is substantially designed to correspond to the height dimension of the edges 1d of the frame parts.

Particularly in Fig. 3, the container for medical equipment is shown opened before its actual use for self-care operations. Thus the first frame part 1a of the container frame 1 is shown on the right, comprising an inside part with a filling part 10. The second frame part 1b is provided with a compartment 11 or the like, with pigeonholes 11a for parts and accessories. The container for medical equipment is provided with a sheet 12 of stick-on labels 12a which can be attached on the lids 11b of the compartment 11. The compartment 11 is, at least the lids 11b thereof, made of a transparent plastic material, as well as the stick-on labels 12a of the sheet 12, whereby the contents of each pigeonhole 11a can be visually controlled also when the lid 11b is closed. Thus, the control of new supplies needed for self-care is facilitated.

In the embodiment of Fig. 3, the support 5 consists of substantially two parts, whereby that part of the support 5 which is placed against the compartment 11

is provided with fixing means 13 for utensils needed particularly for recording the follow-up results of the blood sugar level, such as a recording pad 14 and a pen 15 (see Fig. 4). In one embodiment, the support, i.e. both parts thereof or possibly the support as a whole or in part, can be formed of two superimposed films 5a, 5b, whereby a flat pouch 16 containing a refrigerant can be placed in the slash therebetween, as shown in Fig. 3. The pouch may consist e.g. of a combination of a coating material 16a and a refrigerant 16b therein (see partial enlargement in Fig. 3). When necessary, the coating 16a can be made of a suitably stiff material; it should, however, be durable with respect to changes of form in practice. In particular, the upper part 5a of the support should be made of a material that stands point loads, to minimize the effect of point loads caused e.g. during measuring the blood sugar level and writing. These materials include suitable plastic materials, such as PVC and ABS plastics. The flat pouches 16 can be preferably detachable between the films 5a, 5b, whereby they can be placed e.g. in the freezing compartment of a refrigerator for cooling, if necessary, and be inserted in the container for medical equipment at a warmer temperature to ensure that the temperature of e.g. insulin is sufficiently low. The slash between the films 5a, 5b can also be used as a separate storage location e.g. for recipes, dietary instructions or similar documents.

With particular reference to Fig. 4 showing a typical situation of using the container for medical equipment, a blood sugar meter 17 and a lancet pen 18 are visible, which have just been used for measuring the blood sugar level, and the measuring result has been recorded in the recording pad 14. The support 5 is thus placed in a position described above in connection with

Fig. 3 for use as an operational support, whereby the recording pad 14 can be opened to be filled in.

5 According to the basic idea of the invention, the filling part 10, forming at least part of the inside, is so designed that it can receive e.g. the blood sugar meter 17 in a recess 17a and the lancet pen 18 in a recess 18a. The recesses for receiving medical equipment are formed substantially when the container is taken into use, and are designed to correspond to the overall dimensions of said medical equipment so that the equipment can be embedded at least partly in these recesses, whereby the equipment can be easily removed by hand from the recesses for use. Further, 10 Fig. 4 shows a package 19 of urine test sticks as well as two insulin pens 20. The container for medical equipment can naturally include also other equipment, e.g. a glucagon package, placed in the filling part 10 in the manner described above.

20 With particular reference to Fig. 5, the container frame 1 can be advantageously manufactured so that it contains a housing 21 of a plastic material, e.g. PVC or ABS plastic, which is especially chosen with regard to impact-resistance. Further, a softer layer 22 of 25 e.g. polyurethane is placed inside the housing 21 for insulating and cushioning purposes.

30 Inside the first frame part 1a is placed the filling part 10 comprising a closed coating 10a which forms the visible part of the filling part 10 and is preferably made of a plastic material or another film or textile material which is suitably elastic and easily cleaned. Inside the coating 10a, an inner part 10b is 35 arranged of an elastic material, such as modelling clay or the like. This filling part 10, particularly the inner part 10b thereof, has a smooth surface when the container is taken to use, as shown in Fig. 3.

The diabetic person who will use the container can arrange his or her medical equipment in a suitable order according to their dimensions and, using the plasticity of the inner part 10b of the filling part e.g. by pressing lightly, achieve a recess suitable for each device, as e.g. recesses 17a, 18a in Fig. 4. It is thus possible for the diabetic patient to arrange all of his or her personal equipment, including any devices, parts or accessories on market, in one and the same filling part 10. In case any item of the equipment is changed to a type with a different shape, the filling part can, thanks to its elasticity, be reshaped to comprise a recess for the new item. For example, Fig. 6 shows part of a recess 17a e.g. for a blood sugar meter with a sharp edge. On the other hand, Fig. 7 shows, as an example, a recess 20a for receiving an insulin pen 20 in cross-section. Further, Fig. 8 shows, as an example, the cross-sectional form of a recess 19a with a curved surface formed by the shape of a package of urine test sticks.

Further with reference to Fig. 5, the compartment 11 can be made of a plastic material as a separate, substantially solid piece, and fixed on the surface of the insulating and cushioning part e.g. by glueing in a similar manner as the filling part 10. The lids 11b of the compartment 11 are suitably pivoted at the compartment walls between the pigeonholes 11a comprising the bottom parts 11c, and at the end walls 1d.

With particular reference to Fig. 9, the support 5 can comprise a hatch 23 placed against the filling part 10. Thus the hatch 23 can be opened after opening the frame parts 1a, 1b according to Fig. 9 without removing the support 5 completely from above the filling part 10. When the insulin pens 20 or the like are placed under the hatch 23, they are easily accessible for taking insulin when no other self-care

operations are needed. In this case, the opposite half of the support 5 can be provided with a pouch containing a refrigerant as shown in Fig. 9.

5 In some cases it may be advantageous to have several filling parts 10 reserved for a certain container for medical equipment so that they can be replaced, if necessary, e.g. because of dirty or damaged surface material. It is thus advantageous that the filling  
10 part 10 is detachably connected, e.g. by a stick-on connection to the first frame part 1. A sticking layer of e.g. glue can be inserted between the coating 10a and the inner part 10b of the filling part 10 so that the coating 10a remains attached to the inner  
15 part 10b.

Fig. 10 shows another embodiment of the container for medical equipment according to the invention. It comprises a stick-on arrangement 24, 25 placed in the  
20 first container frame 1a; that is, it comprises a bottom part 24 and a set of stick-on bands, plates 25 or the like which can be attached on the bottom part of the stick-on arrangement. These can, for example, be cut by the diabetic person from a larger sheet  
25 into means, e.g. item 29 in Fig. 10, for receiving medical equipment when the container is taken into use. Further, one section of the second frame part 1b is provided with pockets 26, the compartment 11 of Fig. 3 taking up only part of the surface area of the  
30 second frame part 1b. The pockets 26 comprise a slit placed underneath slashes 27 so that parts or accessories can be inserted through the slashes in the direction of arrow 28 in the slits and removed in the opposite direction.

35 It is obvious that the filling part and the stick-on arrangement can be arranged also in a combination in the same frame part or partially in both frame parts.

Also other combinations, which are not expressly presented in the above exemplifying description, are naturally possible as embodiments obvious to a professional in the field. Although the invention is explained in the foregoing with the sole reference to the self-care of a diabetic patient who can use the container, it is obvious that the container for medical equipment can, at least in a suitably modified form, be used in the care of patients with any disease requiring equipment which cannot be obtained as a compact set from one and the same manufacturer. Furthermore, the principle presented above can also be applied by nursing personnel, using an embodiment modified to meet their needs.

Claims:

1. Container for medical equipment for self-care by  
5 a patient with diabetes or the like, comprising a  
container frame (1), closing means (2) for locking  
the container frame (1) for transport, as well as an  
inside part with fixing and storage means for the  
10 equipment used in the self-care, which inside part  
can be exposed from the container frame (1) particular-  
ly for the needs of self-care, characterized in  
that at least part of the inside part is provided  
with means (10; 24, 25) that are deformable according  
to the dimensions of the medical equipment, particular-  
15 ly with a filling part (10) made of a deformable  
material and/or with an adhesive arrangement (24, 25)  
or the like, whereby the part equipped with said  
means (10; 24, 25) is intended for receiving at least  
part of the individual equipment (17-20) for use by  
20 the diabetic patient, particularly at receiving loca-  
tions (17a-20a; 29) which are formed when the container  
and/or new medical equipment are taken into use.

2. Container for medical equipment according to  
25 claim 1, comprising two frame parts (1a, 1b) of sub-  
stantially equal size, a first and a second frame  
part, which are joined together to a combination that  
can be opened and closed at the edge between the  
frame parts (1a, 1b), wherein the inside part is also  
30 divided into a first and a second section of the  
inside part, characterized in that said means (10;  
24, 25) are placed in connection with the first inside  
section (1a) and that the second inside section (1b)  
is formed of a series of storage locations (11a, 26),  
35 wherein the means (10; 24, 25) are intended particular-  
ly for treatment devices, such as the blood sugar  
meter, insulin syringes, etc. and the storage loca-  
tions (11a, 26) are intended particularly for parts

larly for parts and accessories needed in the use of the devices, such as sticks, needles, etc.

5           3.     Container for medical equipment according to  
claim 1 or 2, **characterized**     in that the inside  
part comprises a support (5), preferably fixed to the  
container frame (1), which is placed at least against  
10           the means (10; 24, 25) in the closed transport position  
of the container and which is intended substantially  
for exposing the medical equipment to be placed outside  
the container frame (1) during the use of the contents,  
thus preferably to be used as an operational support.

15           4.     Container for medical equipment according to  
claim 3, **characterized**     in that the size of the  
support (5) corresponds substantially to the surface  
area of the inner part of the opened container  
frame (1).

20           5.     Container for medical equipment according to  
claim 3, **characterized**     in that the support (5) is  
fixed to the container frame by a bending piece (7)  
or a corresponding pivoted means.

25           6.     Container for medical equipment according to  
claim 3, **characterized**     in that the support (5) is  
provided with fixing means (13) or corresponding  
means for utensils (14, 15) needed particularly for  
30           recording test results on the blood sugar level.

35           7.     Container for medical equipment according to  
claim 3, **characterized**     in that preferably the  
support (5) of the container is equipped with at  
least one pouch (16) or the like containing a refrige-  
rant.

8.     Container for medical equipment according to  
claim 3 or 7, **characterized**     in that the support (5)



is formed of two films (5a, 5b) or the like, at least one container (16) being detachably disposed in the slash therebetween.

5        9.        Container for medical equipment according to  
claim 1 or 2, **characterized**        in that the filling  
part (10) is formed in the container frame by means  
of a substantially closed coating (10a), whereby an  
inner part (10b) of an elastic material, formable by  
10        an external, moderate manual force, is placed inside  
the filling material (10a).

10       10.       Container for medical equipment according to  
claim 9, **characterized**        in that the filling part (10)  
15       is fixed on the container frame by glueing or in a  
corresponding manner to be detached for operations  
of maintenance, modification and/or change of the  
filling part.

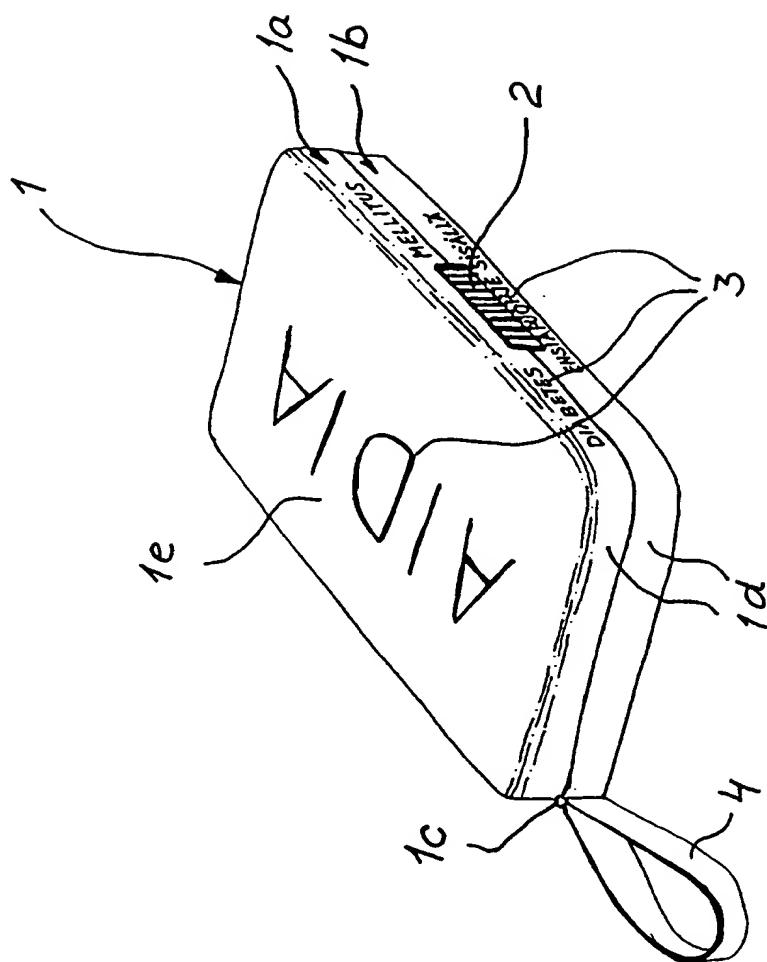
20       11.       Container for medical equipment according to  
claim 1 or 2, **characterized**        in that the adhesive  
arrangement (24, 25) comprises a combination of a  
bottom part (24) placed on the bottom of the first  
container frame (1a) and a set of stick-on bands and/or  
25       plates (25) to be detachably fixed thereon and to be  
formed preferably when the container is taken into use.

30       12.       Container for medical equipment according to  
claim 2, **characterized**        in that the storage loca-  
tions (11a) are formed at least partly of a compart-  
ment (11), the pigeonholes thereof being preferably  
provided with lids (11b).

35       13.       Container for medical equipment according to  
claim 2, **characterized**        in that the storage loca-  
tions are formed of pockets (26).

14. Container for medical equipment according to claim 2, 12 or 13, **characterized** in that it comprises a sheet (12) of stick-on labels or the like, the stick-on labels (12a) thereof containing written or illustrated information with the purpose of attaching the stick-on labels in connection with the storage locations, particularly on the lids (11a) of the pigeonholes (11) and/or on the pockets (26), whereby the said storage locations are intended for use as storage locations of parts and accessories denoted by the respective stick-on labels (12a).

15. Container for medical equipment according to claim 1, **characterized** in that the container frame (1) comprises a combination of a housing (21), which has preferably a plastic coating and whose material is chosen with regard to impact-resistance, and a damping part (22), whose material is chosen with regard to its insulating and cushioning properties, wherein preferably at least part of the means (10; 24, 25) and the storage locations (11a, 26) are detachably fixed on the inner surface of said damping part.



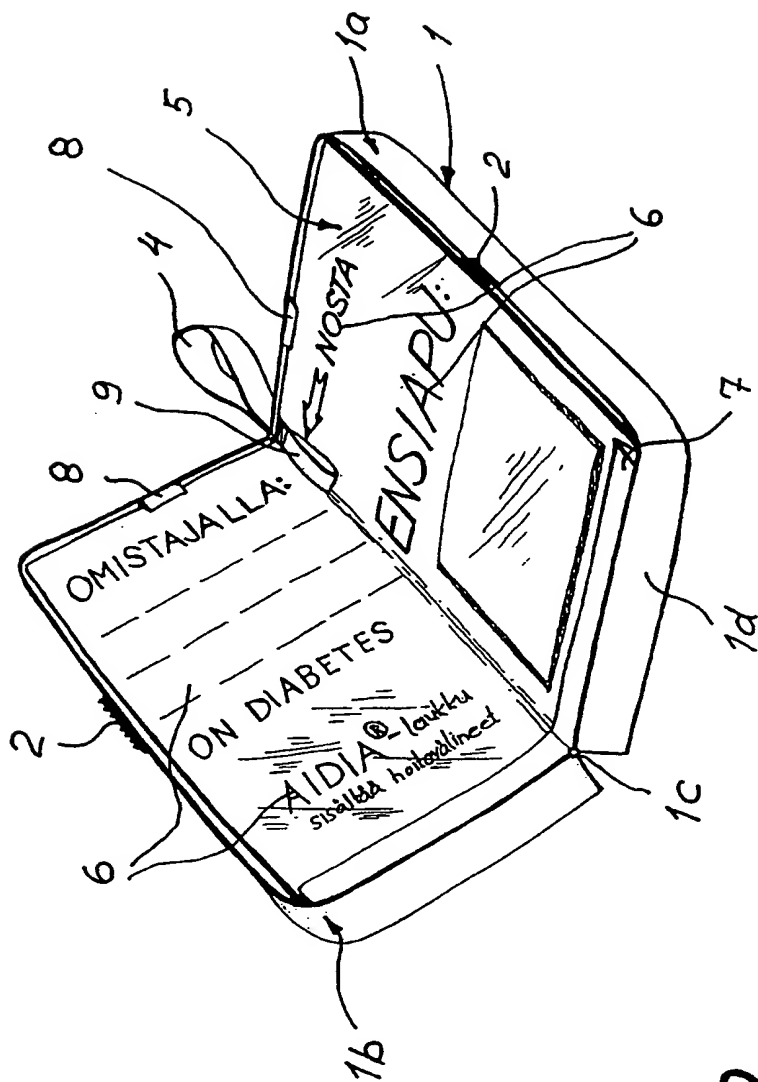
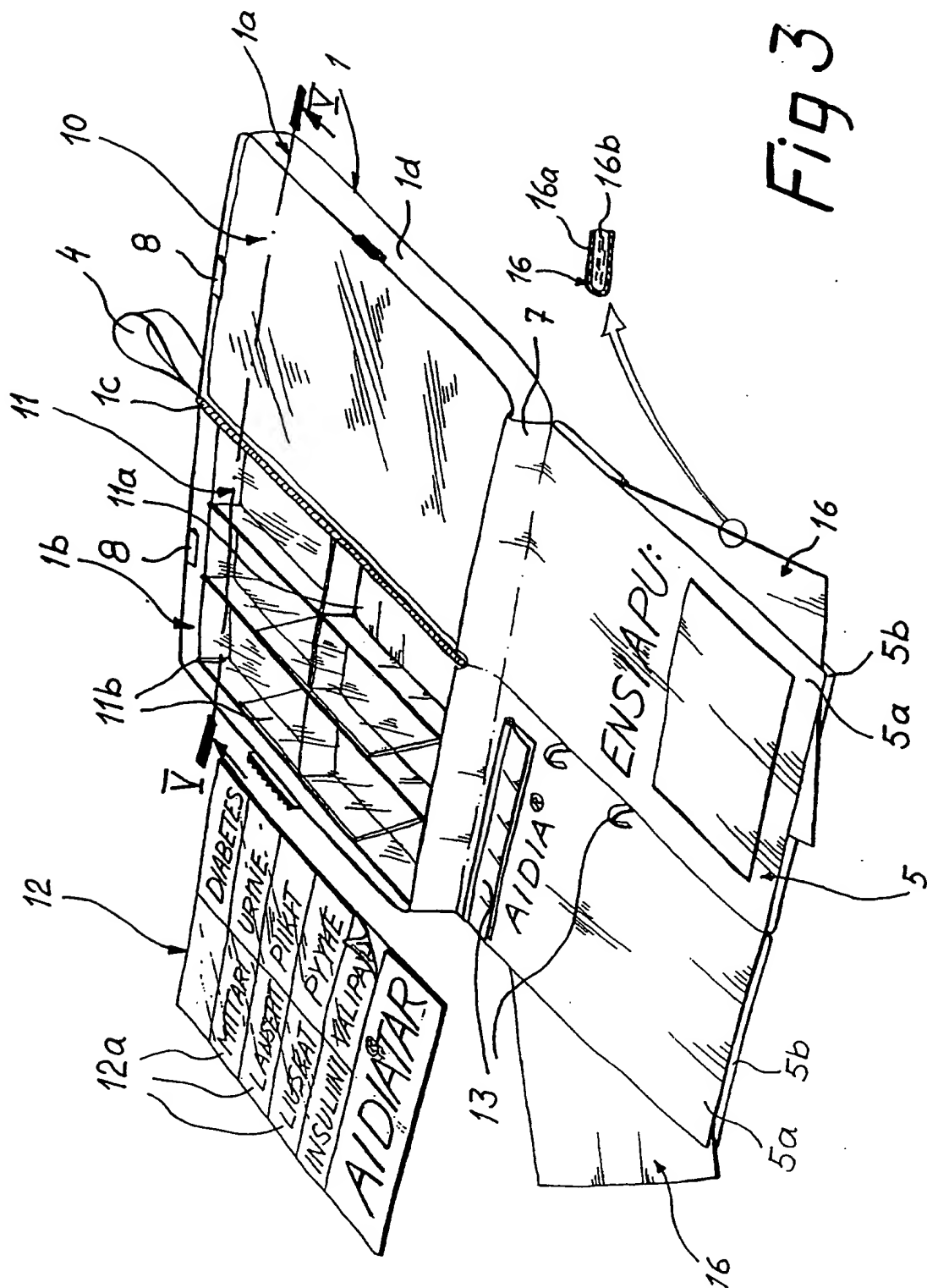


Fig 2



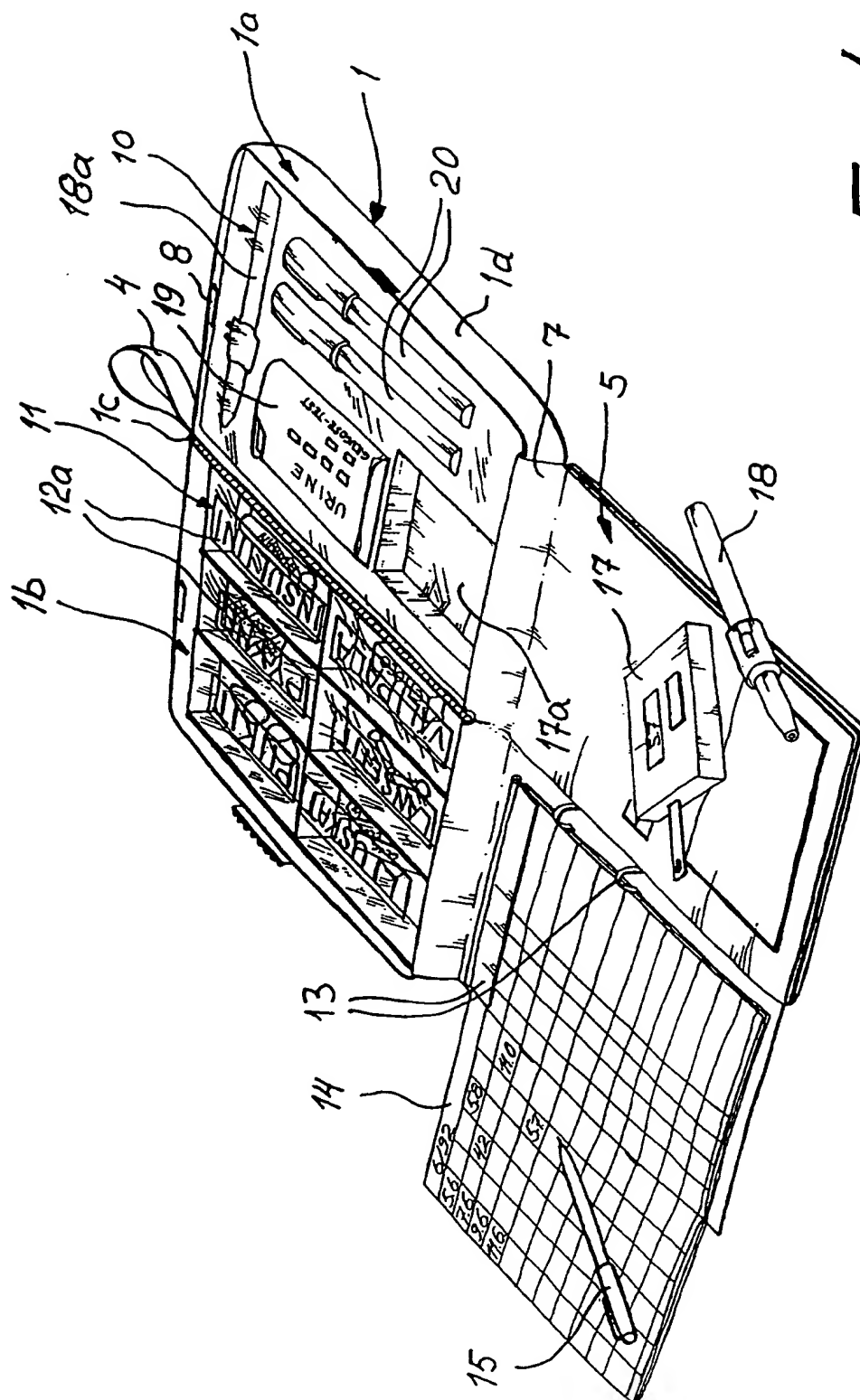
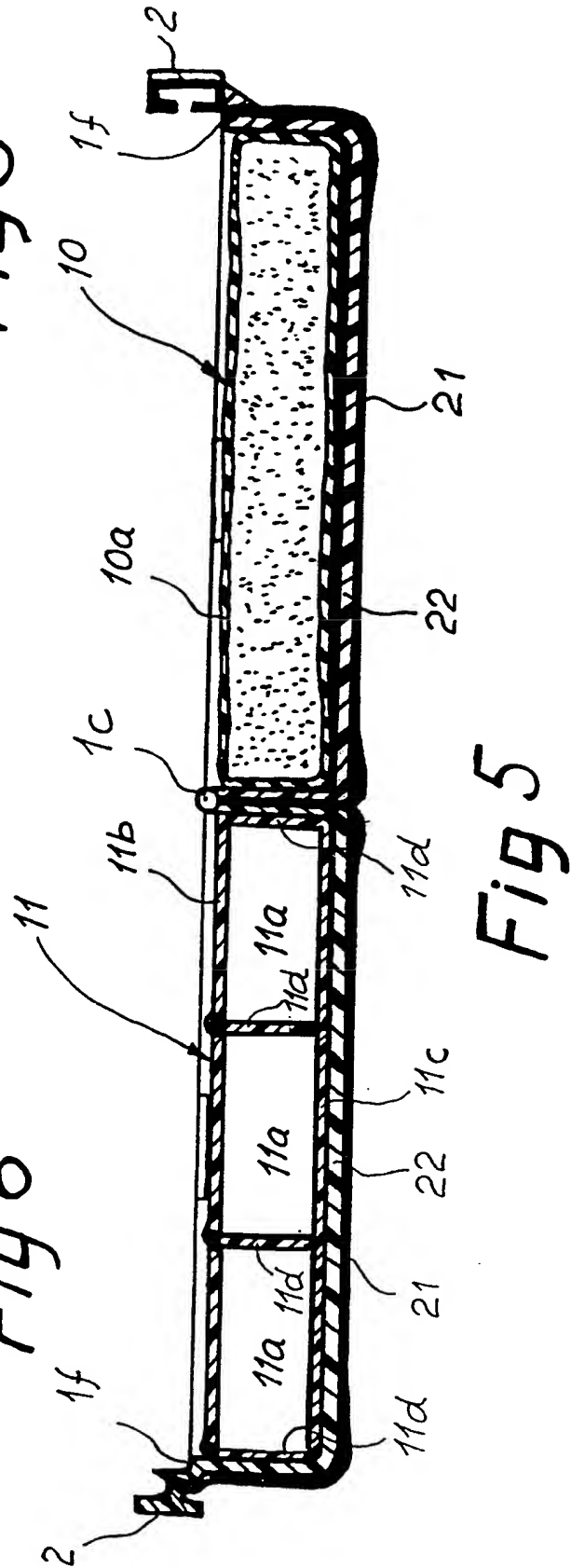
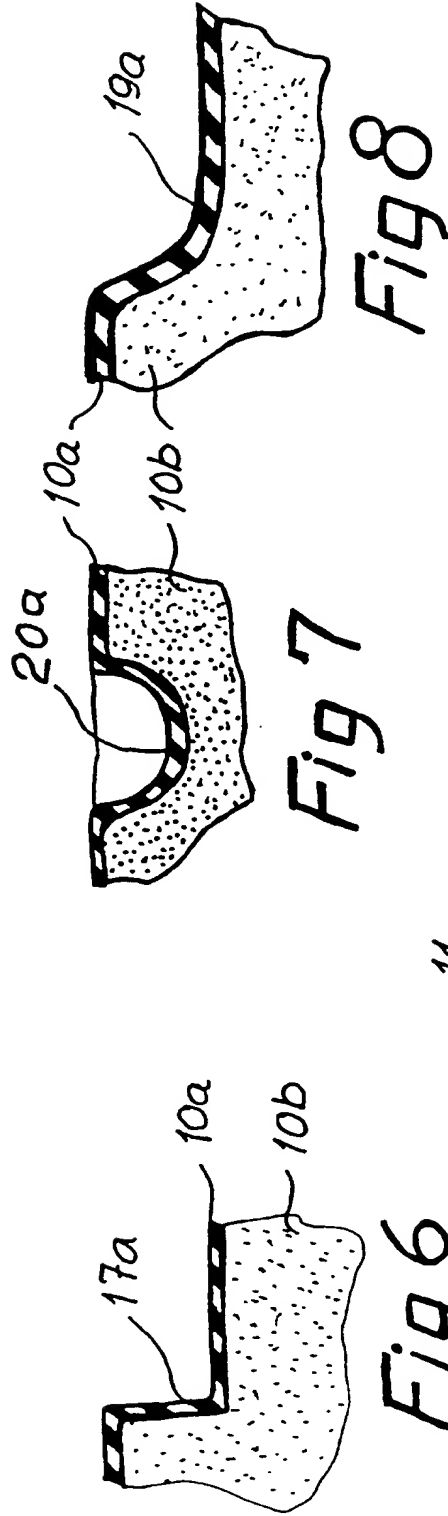


Fig 4



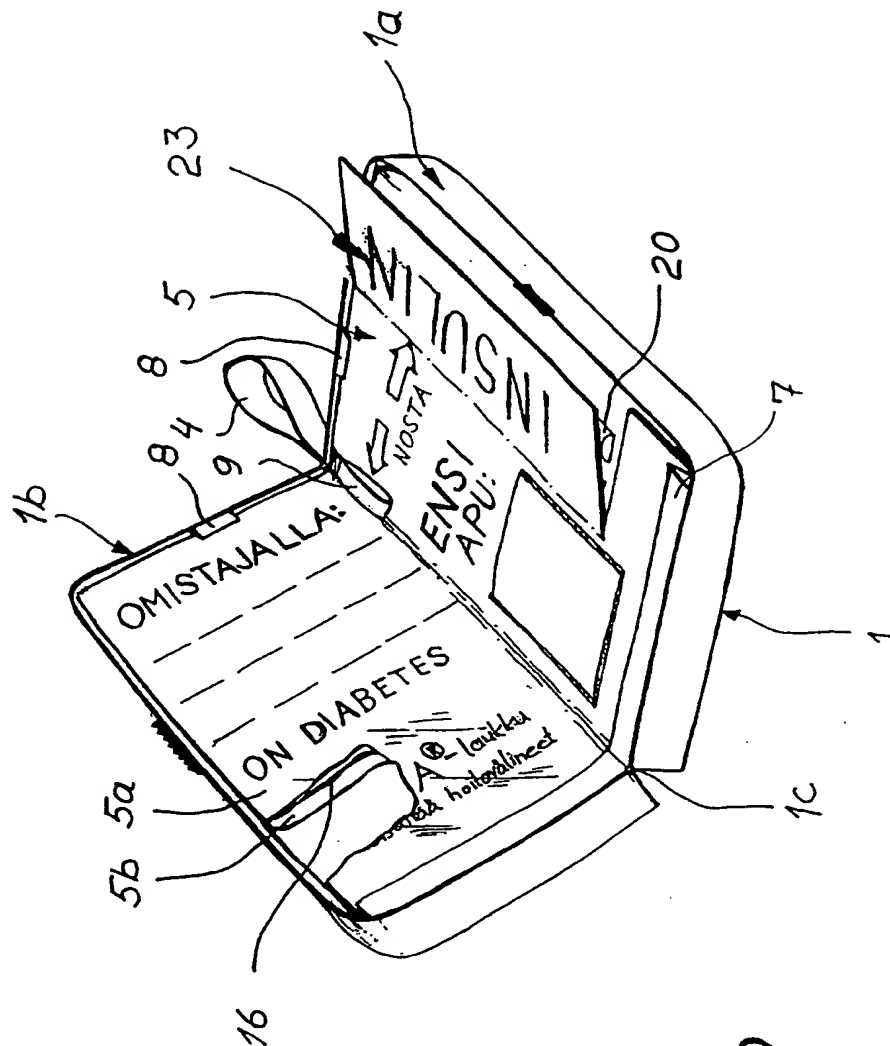
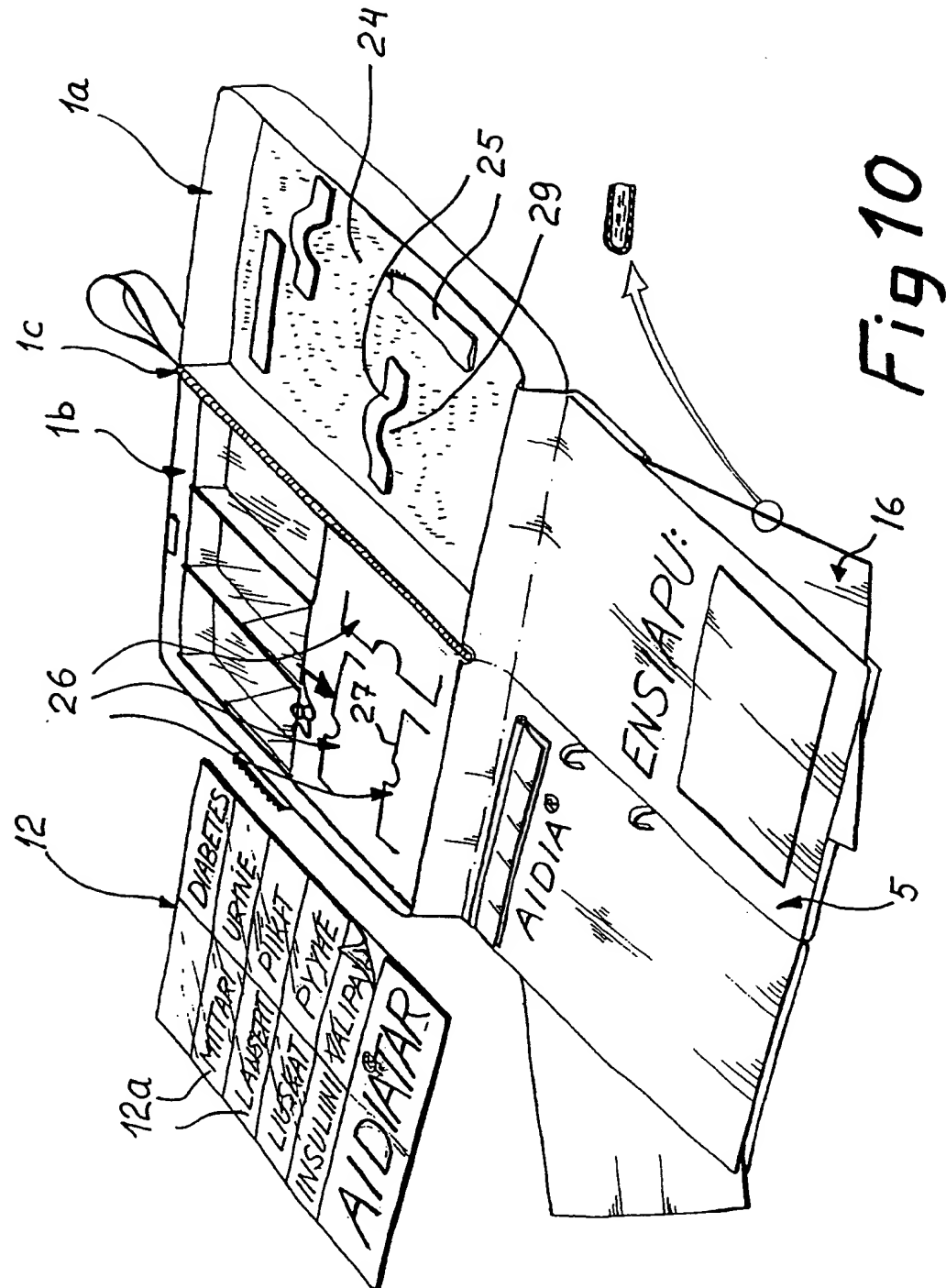


Fig 9





## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 93/00405

## A. CLASSIFICATION OF SUBJECT MATTER

IPC5: A61B 19/02, A61M 5/00, A45C 11/24

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC5: A61B, A61M, A45C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 3777882 (D.J. MCINTYRE), 11 December 1973 (11.12.73), the whole document --	1-15
A	DE, A1, 3124587 (INSTRANETICS, INC.), 11 March 1982 (11.03.82), figure 1, abstract --	1-2
A	US, A, 4429793 (E.G. EHMANN), 7 February 1984 (07.02.84), column 2, line 20 - line 26, figure 1, abstract --	7

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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## INTERNATIONAL SEARCH REPORT

International application No.

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 4446970 (G. FÜRTHNER), 8 May 1984 (08.05.84), figure 1, abstract  -- -----	1

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

07/05/94

International application No.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 3777882	11/12/73	NONE	
DE-A1- 3124587	11/03/82	AU-A- 7209081 CA-A- 1219560 GB-A,B- 2078677	07/01/82 24/03/87 13/01/82
US-A- 4429793	07/02/84	DE-A- 3316361 DE-U- 8313241	17/11/83 25/07/85
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